DOCUMENT RESUME

ED 351 321 SP 034 158

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TITLE An Interactive Strategy for the Instruction of Critical Thinking in the Middle School.
PUB DATE [92]
NOTE 14p.
PUB TYPE Reports - Descriptive (141)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS Brainstorming; *Critical Thinking; Developmental Stages; *Group Discussion; Interaction; Intermediate Grades; Junior High Schools; *Learning Strategies; *Middle Schools; *Quality Circles; Skill Development; Small Group Instruction; Student Characteristics; Student Role; Teacher Role; *Teaching Methods
IDENTIFIERS Dade County Public Schools FL

ABSTRACT

This paper describes an interactive strategy for the instruction of critical thinking taking place in a middle school in Dade County, Florida. The project involves integration of critical thinking and brainstorming, using the quality circle approach. Based on developmental characteristics, certain principles impact middle school curricula: (1) the learner must be an active participant; (2) strategies for learning should be taught, modeled, and retaught as necessary; and (3) small learning groups should be a regular part of classroom organization. The quality circle process as it relates to critical thinking fits with the objectives of middle school education: students are allowed to move and work with others in the class; brainstorming activities are designed to allow for frequent changes of pace as topics are discussed; the focus of the problem under discussion is narrowed and the student is allowed the experience of an interactive, positive, and supportive classroom environment; and students are able to make decisions and solve problems in an atmosphere that is nonjudgmental and supportive. The process of learning how to think critically is a crucial skill that students must be taught, and which they must practice and master; the use of quality circles has proven helpful in accomplishing this goal. (LL)

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AN INTERACTIVE STRATEGY FOR THE INSTRUCTION OF CRITICAL THINKING IN THE MIDDLE SCHOOL

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INTRODUCTION

There is an exciting interactive strategy for the instruction of critical thinking that is taking place in a middle school in South Florida. This interactive strategy involves the integration of critical thinking, brainstorming, and wait-time with a principle pioneered in business and industry -- quality circle. The results have been exciting and promising. Students from various ethnic backgrounds are using critical thinking in various context in and out of school. This article will describe the use of quality circle to help teachers create an interactive strategy for the instruction of critical thinking in the middle school.

MIDDLE SCHOOL -- A PERIOD OF CHANGE

No student in the K-12 continuum experiences so many physical, social, emotional, and intellectual changes as the middle school youngster. The student in middle school is capable of a great many accomplishments. However, one must bear in mind that, developmentally, most children of this age [10-13] are still functioning predominantly at the concrete operational stage (Wiles and Bondi,

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1981).

Learners in the middle school years are continually attempting to make sense of their world. They are curious and rely on their knowledge and intuition to give them a perspective of the world that is predictable.

Active participation in learning is a necessity for the middle school learner who thrives on interaction and seeks to be a part of the communal learning experience (Schurr, 1989). By design the middle school youngster needs and longs for peer interaction. John Goodlad's study of schooling (1984) found that the middle school youngster enjoyed school the most when they could socially interact.

The implications of developmental theories, as they relate to the middle school learner, is endless. However, one single theory will not provide a comprehensive approach to creating an environment where most middle school learners can be successful. Based on developmental characteristics, certain principles impact middle years curriculum:

1. The learner must be an active participant
2. Strategies for learning should be taught, modeled, and retaught as necessary.
3. Small learning groups should be a regular part of the classroom organization (Caught in the middle, 1987).

QUALITY CIRCLES IN THE MIDDLE SCHOOL

How does the quality circle work in the middle school? Who is performing

the "job" that needs improving? Taking the last question first, students are performing the "job" of learning how to "think about thinking." Students will need to try different interactive strategies to discover which works best, The teacher's "job" is to present the strategies that will best let students learn to think critically.

The quality circle process allows students to work in small groups (eight maximum) to solve problems, gather data, and problem analysis. Quality circles in the classroom allow each student an equal opportunity to participate in learning how to think. By moving from one student to the next, seeking one suggestion from each student, with no judgment being made by any of the quality circle participants, including the teacher; it was found that there is greater indepth processing of the problems and a greater success rate for each of the circle's participants (Deming, 1954).

But why would quality circle be useful in the middle school? To answer this, one needs to look at the underlying philosophy behind the development of the middle school. The middle school was designed as a bridge between the child-centered years of elementary school and the subject-centered years of high school; a bridge between the teacher and the student functioning in an atmosphere of open inquiry, dialogue, and trust.

The student enrolled in the middle school is living through major changes in his/her life; changes that are not only physical but social. Daniel Eichhorn (1966) developed the term "transescence" to describe the period between childhood and full adolescence. Transescence is a time of changes and confusion

in addition to physical and social growth. Middle school educators need to examine the phases of transescence and pair these stages with the most appropriate instructional strategies.

The quality circle process, as it relates to critical thinking, fits perfectly with the objectives of middle school education. For example, Alexander and George (1981) state that *"middle school students need frequent opportunities for physical movement and frequent change of activity"*. Through the quality circle process, students are allowed to move and work with others in the class. In addition the brainstorming activities are designed to allow for frequent changes of pace as the topics are discussed.

Johnston and Markle (1986) state that *"among middle school students, attention to group behavior is especially important since the peer group begins to emerge as a major influence on individual school behavior"*. By design, the quality circle process narrows the focus of the problem under discussion while allowing the student the experience of a interactive, positive and supportive classroom environment.

Finally, Alexander and George (1981) stated that *"every student should have the opportunity to develop decision-making and problem-solving skills, which would include finding facts, weighing evidence, drawing conclusions, determining values, and keeping their minds open to new facts"*. The quality circle process is designed to let students make decisions and solve problems in an atmosphere that is non-judgmental and supportive. The quality circle calls for students to share

ideas and challenge each other in order for conceptual change to occur. Verbalization is an integral part of the quality circle process and thus, through intellectual dialogue, students cognitive processes are expanded.

Therefore, after examining the high correlation between the developmental stages of the transesence youngster and the methodologies of quality circle, it appears that quality circle would be beneficial as an interactive strategy that focuses on critical thinking with the middle school student.

QUALITY CIRCLE

References to quality circle as a management tool used to improve market reception of Japanese products can be found as early as the early 1950s with material published by H. Edwards Deming and Joseph Duran. In 1961, Kaoru Iskikawa, an engineering professor in Tokyo, with the backing of the Japanese Union of Scientists and Engineers (JUSE), suggested that small groups of workers should be utilized to address problems in their respective job and work places. The premise for this approach was that "a person who performs a 'job' is the one who best knows how to identify and correct problems found in the job" (Deming, 1954, pg 23).

The following parameters are used when forming quality circles:

1. Size of 3-15, with 8 members being optimum
2. Regular meetings (one hour per week)
3. Circle participants trained in problem solving, data gathering, and problem analyzing

4. Circle participants define problem(s), narrow focus, find solutions, and make recommendations (Mohr & Mohr, p.17).

The quality circle philosophy was first introduced in the United States in the early 1970s when Union Carbide sent a group of managers to Japan for training in the quality circle process to management. In 1982, a New York Stock Exchange study found that 44 percent of all United States companies with 500 employees had quality circle programs. As of 1985, the International Association of Quality Circle (IAQC) had 7,000 plus members up from 100 members in 1978 (Mohr & Mohr, 1986).

CRITICAL THINKING IN THE MIDDLE SCHOOL

What is critical thinking? Depending on who one asks, one might get a different response. For this middle school project the principles of meta-cognition were employed to define critical thinking. Therefore, critical thinking is an integrated and interactive process that has one thinking about thinking.

Critical thinking requires that students be taught the thinking skills within the subject/content area. The critical thinking (an integrated and interactive process that has one thinking about thinking) requires practice. The practice can be either a deductive approach (students are the major vehicles of discovery) or an inductive approach (teacher is the prime vehicle through which students "discover" the thinking process). An interactive approach should work, which requires the teacher to model the thinking process while regularly involving students in the critical thinking process.

The interactive critical thinking strategy requires students and teachers

to take risks. One way to encourage this risk taking behavior, and foster a classroom environment of trust, is through the use of a quality circle. The application of this concept to this middle school project on critical thinking produced some interesting results.

Teaching critical thinking in the middle school is important because it helps the middle grade student learn to reason and solve problems more systematically so that they can function as independent learners; it teaches students to address their problems in a "planful" way. (Parker, 1987).

The project that combined critical thinking instruction and quality circle at the middle school level is in Dade County, Florida. Dade County is the fourth largest school district in the nation. The principal of this tri-ethnic middle school [36.1 Black, 28.1 Hispanic, 33.5 White, 2.4 Asian] decided that he wanted to emphasize an interactive approach to critical thinking skills across grade levels and academic subjects. To this end he hired staff with the specific ability to incorporate critical thinking instruction into all grades at the middle school level.

QUALITY CIRCLE STRATEGY IN THE CLASSROOM

A component of this project included the use of quality circle to help students learn how to think about thinking. The combining of critical thinking skills with quality circle was initially used when introducing a concept or topic in class.

The process went as follows:

1. Students were initially instructed in the fundamental process of

thinking about thinking. The process of mental imagery was explained as well as how it could be used for each thinking process. Topics were discarded and students were told to visualize the topic. What did they visualize? Did they use all of their senses?

2. The students were given instruction in brainstorming and the use of quality circle. The rules of brainstorming were:

    a. no criticism/no putdowns

    b. no evaluation or judgment by any circle members

    c. all ideas are accepted

    d. initially, strive for quantity not quality of response

    e. piggy back of ideas is encouraged - allows for cross fertilization

    f. record all ideas (Mohr & Mohr, 1986, p. 45)

3. Once brainstorming is explained and practiced, students were reminded that they are to give only one idea when it is their turn.

4. One student was selected as the circle recorder with the teacher serving as circle facilitator. (If a "circle" shape is not feasible, then go up and down the rows. The maximum size of a circle is 15. If class size is above this number, form two circles.

5. When a circle participant was called on he/she either: (a) gave a suggestion, (b) built (piggy-back) on another circle idea, (c) or passed. The circle participant was given three to five seconds to participate.

The circle continued to work until all circle participants pass.

Once the quality circle was completed, the teacher reviewed the process that took place to help reinforce the students' critical thinking. This was accomplished by eliciting answers to the following interactive questions:

What thinking skill did we use?

How did we start the thinking process?

Where else might we use this thinking process?

How did brainstorming help us with this process?

Why is this thinking skills process and brainstorming strategy useful?

One way we used quality circle and brainstorming to increase critical thinking was during a sixth grade class discussion of self-concept. The teacher began this introductory lesson on self-concept by telling the students she wanted to know what they already knew about self-concept. She reminded the students of the following established guidelines for their quality circle and brainstorming session:

1. one idea per turn in the quality circle
2. no yelling out of ideas
3. no idea can be repeated (so listen carefully)
4. can build on another idea (piggyback)
5. all ideas/suggestions accepted
6. teacher serves as recorder placing ideas on the chalkboard using the

graphic organizer called "The Web" (oval circle where the topic of the session is written and lines emanating from the oval circle on which suggested ideas are written)

This quality circle went on for 25 minutes. At the end of the circle (last member of the circle passes [no new or building ideas), the teacher starts a review of what had taken place. The teacher began this process by stating, out loud, what steps she reached to come up with some of her ideas. The students then continue the discuss until class comes to closure.

Another example of using quality circle and brainstorming to impact critical thinking was in an introductory class on weather. The teacher wanted to discover what pre-knowledge the students had on the upcoming unit on weather. The teacher started the circle by stating that there were many things that impacted and made-up our weather. The class then began the quality circle on weather by using the above listed procedures.

It was found that the use of quality circle and brainstorming as a method of introducing issue or topic which focused on critical thinking skills insured that all class participants took part in the process. The quality circle allowed students the opportunity to give input from the start, not just during formalized tests.

CONCLUSION

But why use the quality circle and brainstorming? Why not let the teacher lecture on the issue or topic? Why not leave the suggestions of the class open to those who think the fastest?

To learn to think, one must be given many opportunities to practice the thinking process, therefore, brainstorming and quality circle help promote the thinking process by:

1. opening discussion to all circle members
2. accepting all ideas (no judgment is passed)
3. creating an atmosphere of collaboration and teamwork
4. considering more than one type of issue or topic

The actual benefits from using this interactive approach to teaching of critical thinking were:

1. increased student participation
2. improved levels of communication
3. greater social and academic progress
4. improved problem identifying and solving techniques
5. decreased off-task and disruptive behaviors
6. transfer of 'thinking strategies' to other settings

The process of learning how to think critically is a crucial skill that our students must be taught, practice, and master. Teachers will need to reflect on their own teaching and inter-personal skills. Are they willing to allow students the time to interact? Are they willing to allow repeated practice and refinement of the thinking process? Teachers need to prepare themselves to offer new interactive teaching strategies in helping students learn to think about thinking. The use of quality circle, and brainstorming have proven to be useful in accomplishing this

goal.

Through this project, I have found that by integrating the process of the quality circle (size, feedback, neutrality, and function), brainstorming and wait-time most students' abilities to think critically have been positively impacted. This interactive and integrated process has helped students experiment, test, evaluate, transfer, and critically think in other situations and settings in their lives.

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